1907MNRAS..67..566D

Note on a Meteoric Shower. (The August Draconids.)

By W. F. Denning.

On 1907 August 15 I saw five meteors during a watch of forty minutes from a radiant at 288° + 61°. One of them was stationary at that point. On August 26 at 9^h 18^m I observed a brilliant member of the same shower falling from 231° + 57° to 213° + 50°, and showing some curious fluctuations in its light. On August 28, during a short period of clear sky, I recorded two other meteors from the same radiant. On August 15, Mr. H. Corder saw a Draconid equal to Mars flashing out with an orange colour at 288° − 10°, and falling 8° further in a vertical path directed from a point one degree west of β Cygni.

The shower is evidently active between August 15 and 28, and I recognised it between these dates in the years 1887, 1899, and 1900. Mr. Corder had also seen it pretty richly manifested on 1879 August 16 from 286° + 61° (10 meteors).

This display of Draconids, coming, as it does, concurrently with the rapidly declining stages of the great Perseid shower, deserves special mention, and particular efforts should be made in future years to re-observe it. In 1879 August 21 to 25, of 225 meteors which I recorded, no less than 56 were Draconids, and nearly all of them were bright, slow-moving objects with yellow trains. During the twenty-eight years which have passed since 1879 I have never seen the shower richly exhibited until last month, when, however, my observations were very imperfect on account of ill-health. Particulars of this evidently prominent and periodically visible system of meteors, as it appeared in 1879, will be found in the *Monthly Notices*, vol. xl. pp. 127–8, and in *The Observatory*, vol. iii. pp. 172–3.

Bishopston, Bristol:
1907 *September* 1.

Downloaded from http://mnras.oxfordjournals.org/ at Stockholm University Library on July 10, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System

1907MNRAS..67..566D

On Trigonometrical Differences of Altitude.

By G. Tyrrell McCaw, M.A.

In the present methods in use in practical geodesy for determining the difference of altitude of two stations on the Earth's surface, it is common to assume that the vertical refraction at both ends of the line joining two stations is the same. Sometimes even the error seems to be made of implicitly assuming that refraction is eliminated by simultaneous and reciprocal observations at the two ends.

The refraction at each station is commonly regarded as a linear factor of the "contained angle" subtended by the stations at the Earth's centre; or, in other words, is considered as being directly proportional to the distance between the two stations projected on the geodetic surface. The refraction r is therefore expressed thus—

$$r = k \, . \, \psi,$$

ψ being the contained angle and k the so-called "coefficient of refraction."*

Numerous experiments in various parts of the world have shown that this coefficient is by no means constant, not even for the same station. Thus in the United Kingdom, though in 72 cases the value lay between 0·0733 and 0·0804, among 144 cases the values varied between the extremes of 0·0320 and 0·1058. Even in the clear air of mountain heights, where one usually obtains consistent results, there may be wide differences. Thus in the line Ben Lomond to Ben Nevis, the value on Ben Lomond was 0·0719, while on Ben Nevis it was 0·0942.

In Western America, when the refraction at a single station was investigated, the coefficient was found to have a diurnal range as great as 0·04 in some cases. Periods of rapid change occurred about an hour before sunrise and an hour after sunset. The time of *maximum* was about 3 a.m., and the time of *minimum* varied at different stations between 10 a.m. and 4 p.m., the hour from 2 to 3 p.m. marking apparently the mean period. On the line Mt. Diablo—Martinez East, the value at 3 p.m. at the former station (height 1173 metres) was 0·0653, and at the latter (57 m.) 0·1007, while at the latter the value rose to 0·1415 at 3 a.m. The value for the interior of the continent was about 0·065, over parts of the sea near the Atlantic coast about 0·078, and over parts of the sea near the Pacific coast about 0·085. Generally speaking, low elevations gave higher values and greater range; higher values were also obtained in the excessive moisture of the sea-coast. The range of temperature seems chiefly to determine the form of the curve which represents the diurnal variation of the coefficient; height or moisture, its position.

---

* In Continental practice it is the custom to apply the symbol k to the ratio of the total refraction to the contained angle.

Downloaded from http://mnras.oxfordjournals.org/ at Stockholm University Library on July 10, 2015

© Royal Astronomical Society • Provided by the NASA Astrophysics Data System